

**Big New
Breakthrough
In Home
Entertainment**

Pick and Play Your Own TV Shows



Three well-known firms—RCA, Sony and Panasonic—are about to market a simple cassette-type video tape player that hooks onto your TV set to show color or black-and-white programs whenever you want

By LEN BUCKWALTER

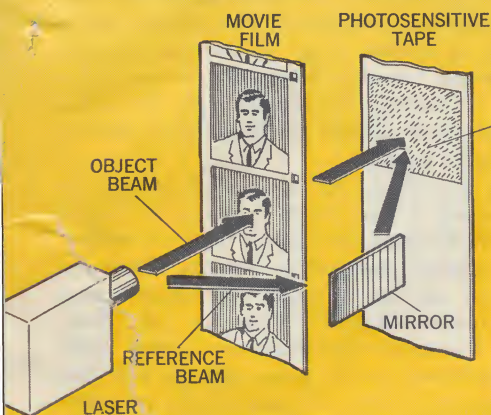
IMAGINE THAT YOU PICK a small tape cassette off a shelf, slip it into a slot next to your TV set and watch a color picture spring magically to life on the screen. The picture can be anything you choose to watch—an exciting movie, a colorful stage show, an historic event, even a course in learning a language.

This dramatic new form of home entertainment is a remarkably simple system for playing full-color video tapes through any color TV receiver. It will also show the same tapes in black-and-white on noncolor sets. Already, three major electronics companies—RCA, Sony and Panasonic—have announced soon-to-come ver-

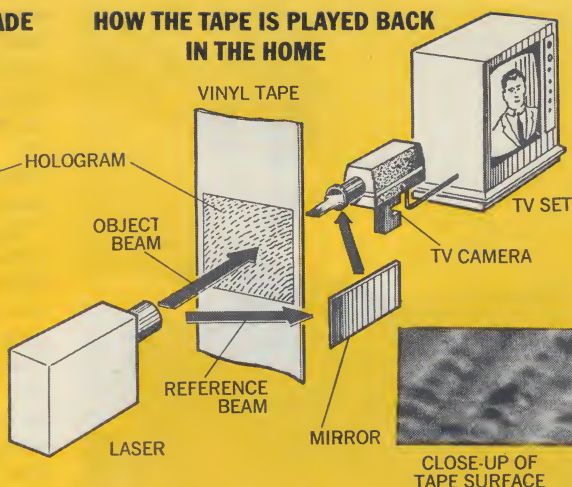
sions of the pick-and-play system. While they differ in principle, they provide essentially the same result: When you're tired of watching regular TV, you'll put on a taped program of your own choosing and play it just like you would a record on a phonograph.

The player itself, in each case, is a trim, smartly styled unit about the size of a conventional reel-to-reel audio recorder except that it takes sealed tape cassettes. The cassettes are easy to handle, require no threading of tape and store in a small space. You just plop one into the player, press a button and on comes the TV picture. All you do to connect the player to

HOW A SELECTAVISION TAPE IS MADE



HOW THE TAPE IS PLAYED BACK IN THE HOME



HOW THE RCA SYSTEM WORKS is shown in diagrams above. Original picture is in the form of conventional movie film. A laser beam is split so that half, called the object beam, shines through the film onto photosensitive tape. Other half, called reference beam, is reflected by a mirror directly onto the tape. Where two beams meet, they produce interference patterns of light and dark lines on the tape—a holographic code representing the movie images. In the light areas, the tape's photosensitive coating becomes hardened. The tape is treated with etching chemicals that eat away the soft portions, producing a pattern of hills and valleys, like a relief map. At right is a

magnified view of an actual tape, showing the bumps in the surface. These impressions are coated with nickel in a plating bath, and the tape is stripped off, leaving a nickel copy or "master." From this master, duplicate tapes are made on inexpensive vinyl plastic strips. In playback, the vinyl copy runs on reels past a laser beam and the process is reversed. The laser recreates the original movie images from the hills and valleys on the vinyl strip. These are picked up by a tiny TV camera in the home player and channeled to the TV set for display like a regular TV program. RCA engineer William Hannan, one of SelectaVision's chief developers, demonstrates the system on facing page

you: TV set is attach wires to the antenna terminals.

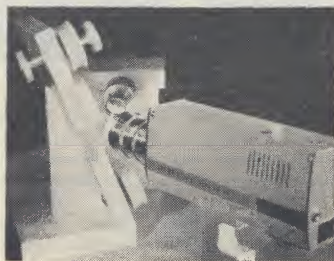
The RCA system, called SelectaVision, may be available as early as sometime this year. Sony and Panasonic are aiming for 1971 or 1972. Prices are not yet definite, but both RCA and Sony hope to market the first players for less than \$400, possibly for as little as \$350. RCA expects to sell prerecorded half-hour cassettes for under \$10 each. Prices on Sony's and Panasonic's cassettes have not yet been determined.

None of the three systems is compatible with the others. You won't be able to play one maker's cassettes on another maker's playback machine. Both Sony and Panasonic use magnetically recorded video tape—similar to the taped programs currently shown on TV—but the tapes differ in width. Panasonic has adopted $\frac{1}{2}$ -inch tape, while Sony has gone to a fatter $\frac{3}{4}$ -inch size.

RCA's SelectaVision is, by far, the most exotic of the three systems. It doesn't use magnetic tape at all. As the accompanying drawings show, a laser beam converts optical images on regular movie film into holographic images on photosensitive tape. Through a process of chemical etching and nickel plating, the tape is



FIVE STEPS in making an RCA tape (left to right): the original movie film, holographic copy, etched tape, the nickel master and the final vinyl strip



LAB SETUP at right shows a typical RCA playback arrangement: tape transport in center with laser and TV camera on either side



RCA PLAYER is low and compact, can sit on top of TV set, as above, or on a nearby shelf. Like Sony and Panasonic units, it requires only two connections to the TV's antenna terminals in back. To put on your own program, you just drop in a small tape cassette and press a convenient button. The player contains a tiny TV camera that feeds signals to set like closed-circuit TV. Cassettes will sell for less than \$10



PANASONIC PLAYER resembles conventional reel-to-reel tape recorder except that reels are encased in a plastic magazine that can be slipped in and out easily without any tape threading. Movies, stage shows, sports events and other programs are pre-recorded on 1/2-inch-wide magnetic tape, slightly narrower than Sony's 3/4-inch tape. Like other systems, tape handles both color and black-and-white

copied onto a metallic "master" that contains impressions like those in the grooves of a phonograph record. This master and a strip of cheap vinyl plastic are merely squeezed together between pressure rollers, embossing the plastic with the same holographic images as the original photo-sensitive tape.

In playback, the recording process is reversed. A laser beam in the home player shines through the plastic tape, recreating the original holographic images. These are picked up by a small TV camera and transmitted to your TV set. As in the Sony and Panasonic systems, the sound track is recorded on the same tape so that the audio and video portions of the program are reproduced simultaneously with perfect synchronization. The metallic master can be used over and over to press thousands of new tapes just like a master disc recording turns out copies of a popular record.

Each system has its special advantages. Sony's and Panasonic's magnetic tape can be erased and rerecorded many times. When you've tired of one selection, you'll be able to send it back to the manufacturer and have it replaced with another. Also, with an adapter attached to your TV set, you'll be able to record programs right off the air for showing later.

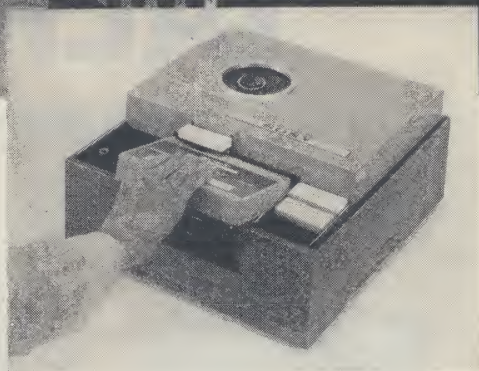
RCA's holographic tape can't be erased and rerecorded, but it has other merits. The inexpensive mechanical duplicating process is expected to make SelectaVision tapes less costly than magnetic tapes. Also, unlike magnetic tape, the plastic SelectaVision material is virtually indestructible.

At an RCA demonstration, William Hannan, who heads the group that developed SelectaVision, asked me to watch a startling phenomenon. He had an SV tape playing through a nearby TV receiver. The scene was a football game with a player charging forward, chest thrust outward. Hannan said, "Watch this" and rammed an ice pick into the tape. I snapped a glance at the TV screen, expecting to see the football player's chest torn open by a javelin. But there wasn't a scratch on him. Hannan withdrew the pick, then gleefully attacked the tape with sandpaper. "That's equivalent to about a thousand hours of wear," he said.

The secret of the tape's toughness is that a hologram doesn't record light in the



SONY PLAYER slides out in a drawer like many hi-fi recon changers. Playing a TV tape is as simple as putting a record on a phonograph. Tape cassettes are about the size of a paperback book, can be stored in rows on a shelf for easy selection. A special adapter, to be sold separately for about \$100, will also let you record TV shows off the air. Starting the player automatically disconnects TV antenna and switches over to tape signals. At end of play, antenna is switched back in for receiving regular TV programs. Tapes can be played over any vacant TV channel that's not used in your particular area.



usual optical fashion. Each image, or frame, actually consists of 24 sub-holograms, each containing the identical picture information. That's why the football player came through unscathed. While the pick destroyed some of the sub-holograms, plenty were left to construct a complete image.

While the three systems aren't interchangeable, there's not likely to be any shortage of program material for whichever one you choose. All three makers are planning extensive libraries of cassettes to fit their own machines. In addition, in-

dependent producers are certain to offer a wide range of selections in all three formats just as they now do for different tape and record formats.

Some of the program selections already in the works range from great sports events, opera, Broadway shows and children's stories to Neil Armstrong planting the American flag on the moon. Eventually, it may be possible to convert home movies to holographic tapes or to record your own family video shows on magnetic tape, providing the ultimate in exciting, versatile home entertainment. ★★★